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10/521,732	01/19/2005	Li-Qun Xu	36-1883	6894

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EXAMINER
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ART UNIT	PAPER NUMBER
2129	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05/05/09*.
2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *11-18* is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *11-18* is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☒ The drawing(s) filed on *10/30/06* is/are: a)☒ accepted or b)☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a)☐ All   b)☐ Some * c)☐ None of:
      1.☐ Certified copies of the priority documents have been received.
      2.☐ Certified copies of the priority documents have been received in Application No. _____.
      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

DETAILED ACTION

1. This communication is considered fully responsive to the
   Amendment filed on 5/05/2009 for the patent application
   10/521,732. Claims 11-18 have been examined and remain
   pending.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms
   the basis for all obviousness rejections set forth in this
   Office action:

   > (a) A patent may not be obtained though the invention is not identically
   > disclosed or described as set forth in section 102 of this title, if the
   > differences between the subject matter sought to be patented and the prior
   > art are such that the subject matter as a whole would have been obvious at
   > the time the invention was made to a person having ordinary skill in the
   > art to which said subject matter pertains. Patentability shall not be
   > negatived by the manner in which the invention was made.

3. Claims 11-18 are rejected under 35 U.S.C. 103(a) as being
   unpatentable over C. C. Chibelushi et al. (*A Review of Speech-
   Based Bimodal Recognition*) (**Chibelushi** hereafter) and **Haykin**
   (*Neural Networks: A Comprehensive Foundation, Chapter 9*)

Regarding Claim 11, and 15:

Chibelushi discloses:

- feature extraction means (e.g. *Mouth-window methods,* col.
  1: par. 2a, pp. 26, **Chibelushi**) for extracting by a feature
  extraction module (e.g. MFCC feature extraction, Fig. 2) a
  plurality of sets of characteristic visual feature vectors
  and a plurality of sets of characteristic audio feature
  vectors from respective video and audio portions of a

training set comprising a plurality of video sequences belonging to a predetermined class;

- feature combining means (e.g. sensor fusion, Low-level fusion can occur at the data level or feature level. Intermediate-level and high-level fusion involves the combination of recognition scores or labels produced as intermediate or final output of classifiers, col. 1 Section B pp. 28, **Chibelushi**) for combining by a feature binder the plurality of sets of characteristic visual and audio feature vectors into a respective plurality of N-dimensional feature vectors corresponding to the predetermined class (e.g. audio-visual fusion can also occur at a level between feature and decision levels, fig. 1, **Chibelushi**), said combining comprising normalizing and concatenating each of the visual feature vectors with corresponding audio feature vectors (e.g. Some similarity measures are tightly coupled to particular feature types. For speaker verification or open-set identification, a normalization of similarity scores may be necessitated by speech variability [63], [101]. Examples of common similarity measures are: the Euclidean distance (often inverse-variance weighted, or reduced to a city-block distance), col. 2, section C, pp. 27- col. 1: 1-8, pp. 28, **Chibelushi**);

- analysing by a feature learning module the pluralities of N-dimensional feature vectors using principal component analysis (e.g. Some high-level features aim at reducing dimensionality through a transformation (e.g. transforms are based on *principal component analysis (PCA),* statistical discriminant analysis optimizing the F-ratio

such as *linear discriminant analysis (LDA)* [1], and *integrated mel-scale representation with LDA (IMELDA))* that produces statistically orthogonal features and packs most of the variance into few features, col. 1, pp. 25, **Chibelushi**) or kernel discriminant analysis to generate a set of M basis vectors, each being of N-dimensions (e.g. applied to static spectral information, possibly combined with dynamic spectral information, output by a mel-scale filter bank. Composite features are sometimes generated by a simple concatenation of different types of features, col. 2 pp. 25, **Chibelushi**);

Chibelushi fails to particularly call for:
- a plurality of sets of characteristic visual feature vectors and a plurality of sets of characteristic audio feature vectors from respective video and audio portions of a training set comprising a plurality of video sequences
- wherein M << N, and using the set of M basis vectors, mapping each N-dimensional feature vector into a respective M-dimensional feature vector
- using the M-dimensional feature vectors thus obtained as the basis for or as input to train a class model of the predetermined class
- storing the class model for use in classifying input data that matches the predetermined class

Haykin teaches:
- a plurality of sets of characteristic visual feature vectors and a plurality of sets of characteristic audio feature vectors from respective video and audio portions of

a training set (e.g. input pattern presented to the network, (pp. 443-483 especially pp.447, **Haykin**) comprising a plurality of video sequences (e.g. data from input space, fig. 9.4 pp. 455, **Haykin**).

- wherein M << N, and using the set of M basis vectors, mapping each N-dimensional feature vector into a respective M-dimensional feature vector (**Examiner's Note:** continuous input space is mapped to discrete output space through the feature map, fig. 9.4 pp. 455, **Haykin**);

- using the M-dimensional feature vectors thus obtained as the basis for or as input to train a class model of the predetermined class (e.g. input pattern presented to the network, (pp. 443-483 especially pp.447, **Haykin**).

- storing the class model for use in classifying input data that matches the predetermined class (**Examiner's Note:** the aim of the SOM algorithm is to store a large set of input vectors by finding a smaller set of prototypes, so as to provide a good approximation to the original input space, see par. 2, pp. 455, **Haykin**).

Rationale:

Thus, it would have been recognized by one of ordinary skill in the art at the time of the invention to modify the teachings of **Chibelushi** for generating class models from video sequences having one of a plurality of predetermined classes with the teachings of **Haykin** for the benefit of reducing dimensionality or compressing data and also to store a large set of input vectors by finding a smaller set of prototypes, so as to provide a good approximation to the original input space.

Regarding Claims 12 and 16, The computer-implemented method as claimed in claim 11, wherein the M basis vectors are the M most discriminating basis vectors that maximize between-class variance and minimize within-class variance (e.g. conditions for the minimization of the expected distortion which is given the input x, choose the code c = c(x) to minimize the squared error distortion ||x - x'||2, pp. 456, **Haykin**).

Regarding Claims 13 and 17, The computer-implemented method as claimed in claim 11 wherein each video sequence has a non-linear feature distribution (e.g. video sequence is a feature map, (Fig. 9.7b pp. 462), and the property 4 of a feature map is feature selection, see pp. 461, **Haykin**).

Regarding Claims 14 and 18, The computer-implemented method as claimed in claim 12 wherein each video sequence has a non-linear feature distribution (e.g. video sequence is a feature map, (Fig. 9.7b pp. 462), and the property 4 of a feature map is feature selection i.e. video sequence is data from an input space with a non-linear distribution, pp. 461, **Haykin**) .

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

> ***Tsoukalas et al.,*** *discloses*
>
> > - feature vectors are corresponding inputs as the components of an m-dimensional input vector (***Tsoukalas:*** *pp. 309).*

- kernel discriminant analysis to generate a set of M basis vectors sometimes referred to as m-dimensional input vector (*Tsoukalas: pp. 309)*.

- a feature learning module the pluralities of N-dimensional feature vectors (sometimes called n-dimensional weight vector (*Tsoukalas: pp. 309)*.

- a variation of the learning scheme of neurons, which makes the Kohonen network into a classification network called Learning Vector Quantization (LVQ), the modification involves changing the training scheme, which requires a collection of training examples each assigned to one of a set of known classes (*Tsoukalas: pp. 314)*.

Sudaram., discloses the objective function that is to be minimized has constraints (audio/video duration constraints, visual syntax, synchronous multimedia constraints) that are constructed with the aim of maximizing the speech information content and the overall coherence of the video (*Sudaram: col. 1, par. 3, pp. 2)*.

RESPONSE TO ARGUMENTS

Applicants' arguments filed April 07, 2009 have been fully considered but are not found persuasive. Specifically, Applicants made the following arguments:

1. **Rejection Based on U.S.C. 103:**

Argument 1

> In the Office Action, the Examiner has rejected
> claims 11-18 under 35 U.S.C. § 103(a) as being
> unpatentable over Chibelushi et al. ("Chibelushi")
> and Haykin. Applicants respectfully traverse the
> Examiner's § 103 rejections of the claims.
>   The Examiner has not met the burden of providing a
> prima facie case of obviousness based on the above-
> described references. **Applicants have not been
> provided with a copy of the relevant portions of the
> Haykin reference nor have Applicants been provided
> with copies or even an identification of the
> Tsoukalas reference which is cited by the Examiner at
> pages 3 and 4 of the Office Action** (Emphasis Added).

Applicants argues that a copy of the relevant portions of the
Haykin reference nor have Applicants been provided with copies
or even an identification of the Tsoukalas reference which is
cited by the Examiner at pages 3 and 4 of the Office Action has
not been provided. **Examiner disagrees.**

First, an identification of the Haykin reference was provided
to the applicants as a Non-Patent Literature. If a copy of the
relevant portions of the Haykin reference was needed, applicant
should have requested those portions within 1 month of the mail
date of the action (see MPEP 710.06), however, applicant did not
request these relevant portions until 6 months after the mailing
date of the action.

Second, the Tsoukalas reference was not provided because the
claims were not rejected by Tsoukalas. The Tsoukalas and
Sudaram references are given in Notes/Examiner's Notes, which
are not prior art but a link to prior art that one of ordinary
skill in the art would find relevant.

Examiner's Notes are/if provided with the cited references to
prior art to assist the applicant to better understand the
nature of the prior art, application of such prior art and, as
appropriate, to further indicate other prior art that maybe

applied in other office actions. Such comments are entirely consistent with the intent and spirit of compact prosecution. However, and unless otherwise stated, the citations are self-explanatory to one skilled in the art and do not need any further explanation.

Argument 2

> Accordingly, the Examiner's § 103 rejection of the claims is defective in that Applicants have not been provided the information needed to rebut the Examiner's assertions. **Therefore, it is respectfully submitted that the Examiner's rejections of the claims are improper and must be withdrawn.**
> Therefore, in view of the above remarks, **it is respectfully requested that the Examiner issue a new non-final Office Action including citations to any prior art relied upon as well as providing copies of the prior art relied upon** (Emphasis Added).

Applicants argues that the Examiner's rejections of the claims are improper and must be withdrawn and issue a new non-final Office Action including citations to any prior art relied upon as well as providing copies of the prior art relied upon. **Examiner strongly disagrees.**

In response, applicant's claims were rejected under 35 U.S.C. 103(a) as being unpatentable over C. C. Chibelushi et al. (*A Review of Speech-Based Bimodal Recognition*) (**Chibelushi** hereafter) and **Haykin** (*Neural Networks: A Comprehensive Foundation, Chapter 9*).

In this case, the cited references were correct and both prior arts were made available to the applicant and there was no error in the Office action.

Accordingly, the rejections of the claims **STAND.**

Claim Interpretation

a.   The claims and only the claims form the metes and bounds of the invention. "Office personnel are to give the claims their broadest reasonable interpretation in light of the supporting disclosure. *In re Morris*, 127 F.3d 1048, 1054-55, 44USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Moreover, limitations appearing in the specification but not recited in the claim are not read into the claim. *In re Prater*, 415 F.2d, 1393, 1404-05, 162 USPQ 541,550-551 (CCPA 1969)" (MPEP p 2100-8, c 2,145-48; p 2100-9, c 1,1 1-4).

The Examiner has full latitude to interpret each claim in the broadest reasonable sense. The Examiner will reference prior art using terminology familiar to one of ordinary skill in the art. Such an approach is broad in concept and can be either explicit or implicit in meaning.

Examiner's Notes are/if provided with the cited references to prior art to assist the applicant to better understand the nature of the prior art, application of such prior art and, as appropriate, to further indicate other prior art that maybe applied in other office actions. Such comments are entirely

consistent with the intent and spirit of compact prosecution.
However, and unless otherwise stated, the citations are self-
explanatory to one skilled in the art and do not need any
further explanation. Moreover, the Examiner's Notes are not
prior art but a link to prior art that one of ordinary skill in
the art would find inherently or obviously appropriate.

Unless otherwise annotated, as aforementioned, Examiner's
statements are to be interpreted in reference to that of one of
ordinary skill in the art. Statements made in reference to the
condition of the disclosure constitute, on the face of it, the
basis and such would be obvious to one of ordinary skill in the
art, establishing thereby an inherent or obviousness prima facie
case or statement(s).

EXAMINER'S NOTE

Examiner has cited particular columns and line numbers or
paragraph numbers in the references applied to the claims above
for the convenience of the applicant. Although the specified
citations are representative of the teachings of the art and are
applied to specific limitations within the individual claim,
other passages and figures may apply as well. It is

respectfully requested from the applicant in preparing responses, to fully consider the references in their entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner. The entire reference is considered to provide disclosure relating to the claimed invention.

In the case of amending the claimed invention, Applicant is respectfully requested to indicate the portion(s) of the specification which dictate(s) the structure relied on for proper interpretation and also to verify and ascertain the metes and bounds of the claimed invention.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action

is not mailed until after the end of the THREE-MONTH shortened
statutory period, then the shortened statutory period will
expire on the date the advisory action is mailed, and any
extension fee pursuant to 37 CFR 1.136(a) will be calculated
from the mailing date of the advisory action. In no event,
however, will the statutory period for reply expire later than
SIX MONTHS from the date of this final action.

Correspondence Information

Any inquires concerning this communication or earlier communications from the examiner should be directed to Ola Olude-Afolabi, who may be reached Monday through Friday, between 8:00 a.m. and 5:00 p.m. EST. or via telephone at (571) 270-5639 or facsimile transmission (571) 270-6639.

If you need to send an Official facsimile transmission, please send it to (571) 273-8300. If attempts to reach the examiner are unsuccessful the Examiner's Supervisor, David Vincent, may be reached at (571) 272-3080.

Hand-delivered responses should be delivered to the Receptionist @ (Customer Service Window Randolph Building 401 Dulany Street Alexandria, VA 22313), located on the first floor of the south side of the Randolph Building.

Finally, information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Moreover, status information for published applications may be obtained from either Private PAIR

or Public PAIR. Status information for unpublished applications

is available through Private PAIR only. For more information

about the PAIR system, see http://pair-direct.uspto.gov. Should

you have any questions on access to the Private PAIR system,

contact the Electronic Business Center (EBC) toll-free @ 1-866-

217-9197.

> **Ola Olude-Afolabi**
>
> Patent Examiner
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Thursday, June 04, 2009
/O. O./
Examiner, Art Unit 2129
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